



Global Ocean Monitoring and Observing
NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION

Technology: Opportunities and Risks

Eugene Burger

NOAA Pacific Marine Environmental Laboratory

Overview

We will consider the GOMO stance on technologies that impact elements of data management and the goal toward meeting the FAIR principles

Why consider these?

These technologies do present opportunities to meet data management objectives

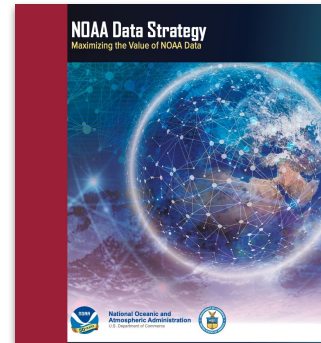
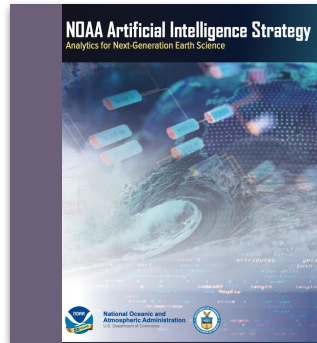
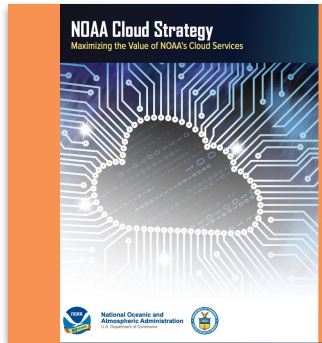
- We should resist the dogged pursuit of the latest technologies

Domains

1. Commercial cloud hosted IT infrastructure
2. Data analysis with the use of AI
3. Communication infrastructure

Catalysts for transformation

- Use resources available to meet data management objectives
- NOAA Strategies
- New opportunities
- Address technological constraints



Cloud hosted data infrastructure

When done well, where data are served from is irrelevant to end-user

Opportunities

- Cloud storage capacity can accommodate and grow with storage requirements
- Potential for GOMO to host a copy of data on single hosting environment*
- Add-on services from commercial cloud vendors
- Service availability
- Co-location of data and computational resources
- Analytical capability to track data access and some use



*Requires attention on discovery metadata and common access

Cloud hosted data infrastructure

Risks to GOMO

- Cost of cloud hosting
 - Difficult to predict storage and data downloads (egress)
- Contractual risk
- Centralizing overhead
- Adoption complexity (Cloud in the Federal government)
- Disruption of existing workflows with cloud-specific storage formats

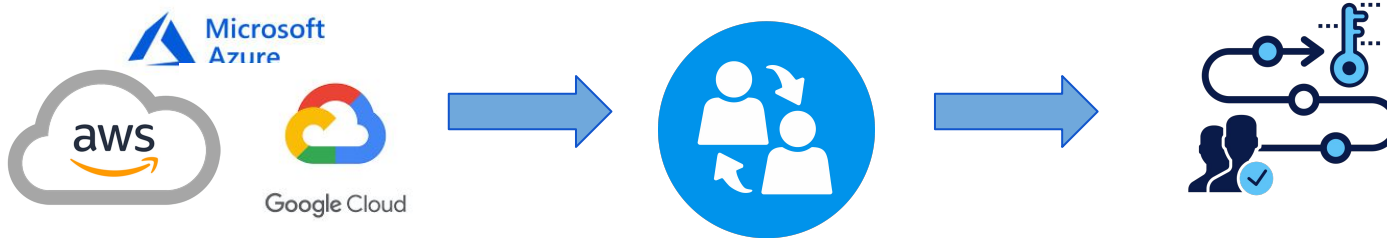
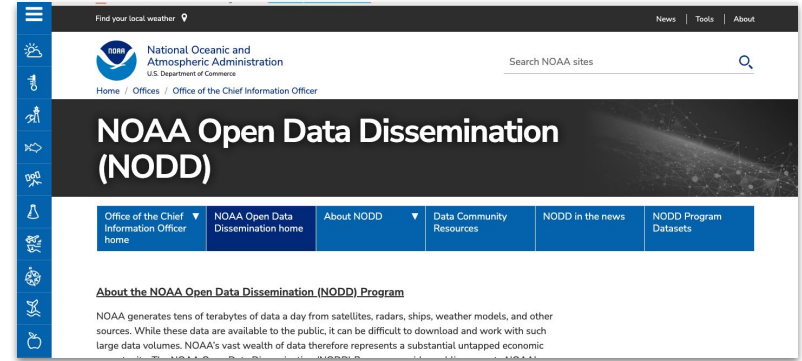
NOAA opportunities

NOAA Open Data Dissemination Program

- No cost storage and data download
- Potential to create a GOMO space on NODD storage

Open science platform

- GOMO focussed open science platform with access to NODD hosted data



A.I. and GOMO data

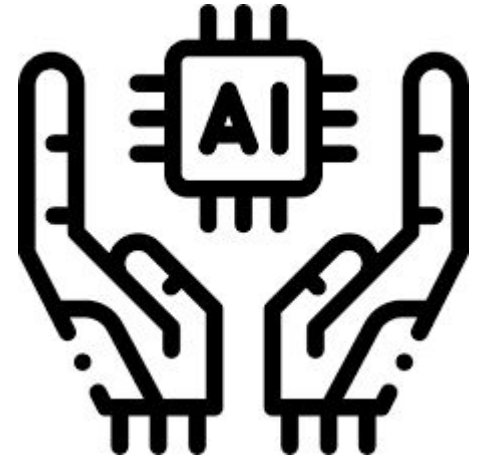
Access to computation cycles has spurred AI advancement

The emergence of turnkey AI solutions

- AI platforms
- Service on commercial Cloud

Opportunities

- Identify application areas against GOMO data
- NOAA activities to explore ML driven quality control



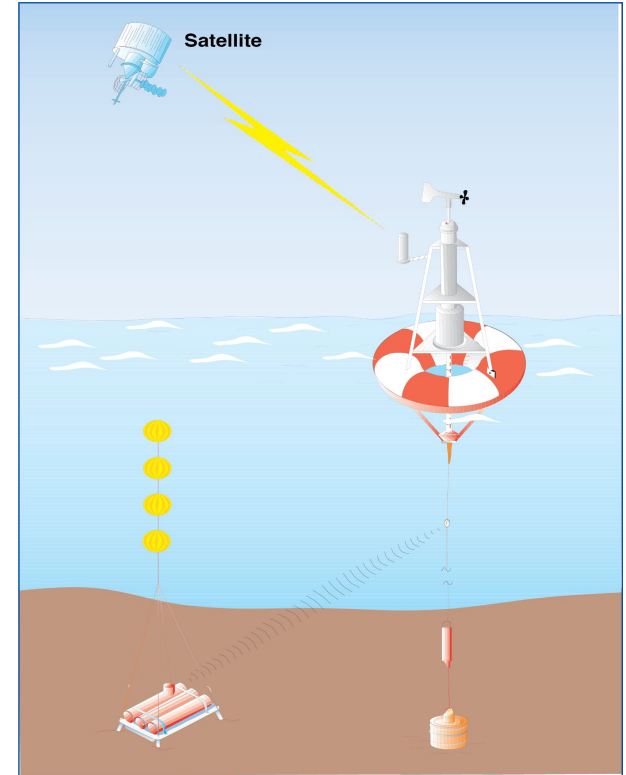
Data telemetry

Rapidly evolving domain

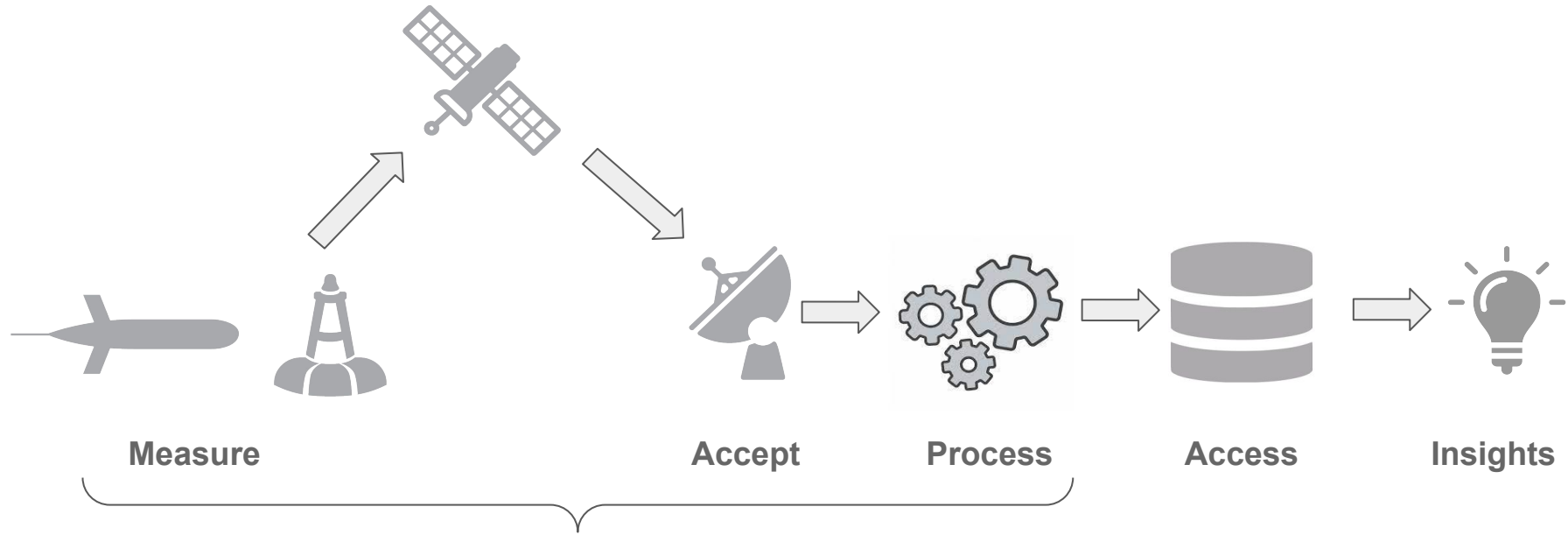
- Emergence of satellite Internet constellations
- Low latency and low cost
- Potential for full spectrum data transmission near-real time

Opportunity

- Greater near-real time data availability and potential cost savings



Harmonization of data telemetry



Opportunities

- Common data payload formats
- From bespoke to industry standards - Internet of Things (IoT) approaches
- Less one-off development, more common data workflows

Conclusion

Equitable access to GOMO data

- Opportunities with measured use of commercial cloud data hosting co-located with open science platforms
- Emergence of turnkey AI solution holds promise in NOAA data QC and analysis
- Consideration of data workflow harmonization to accommodate increased NRT data delivery volumes